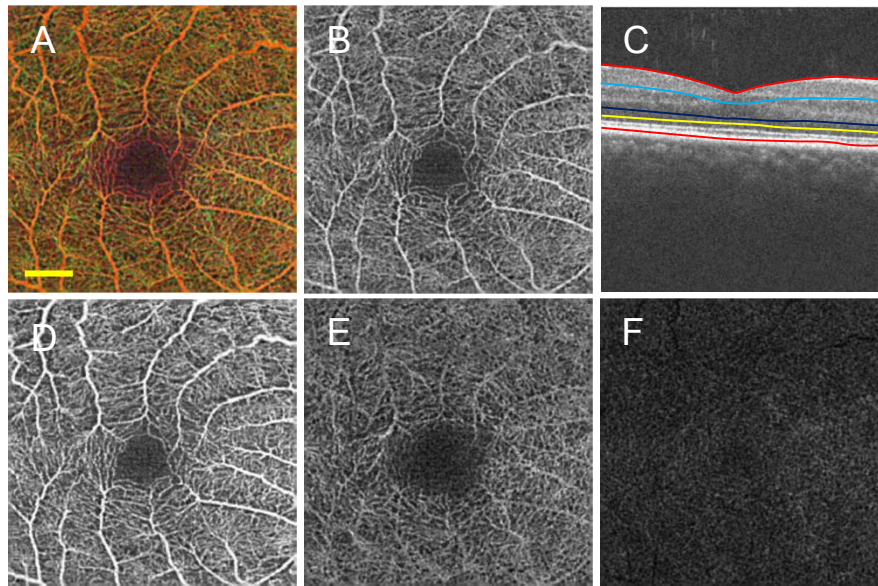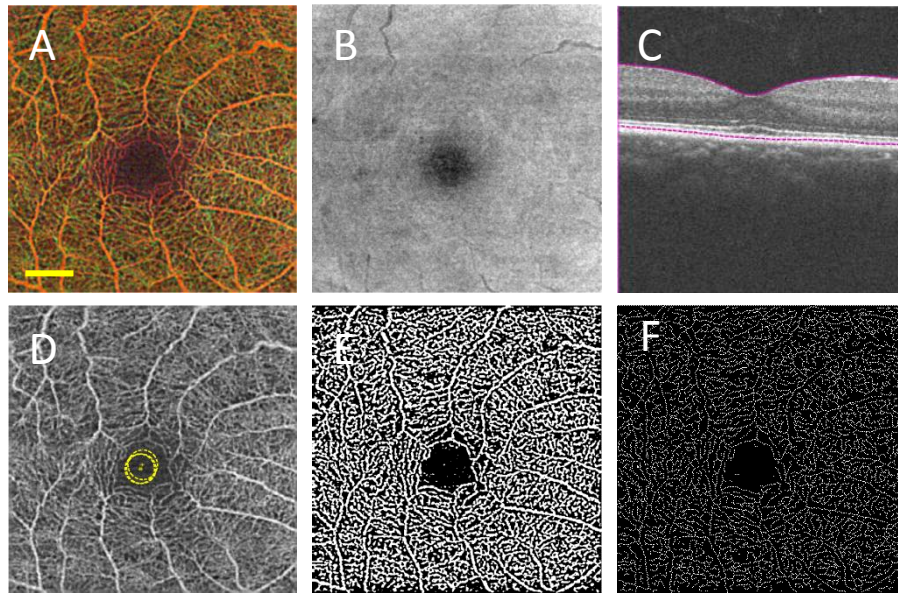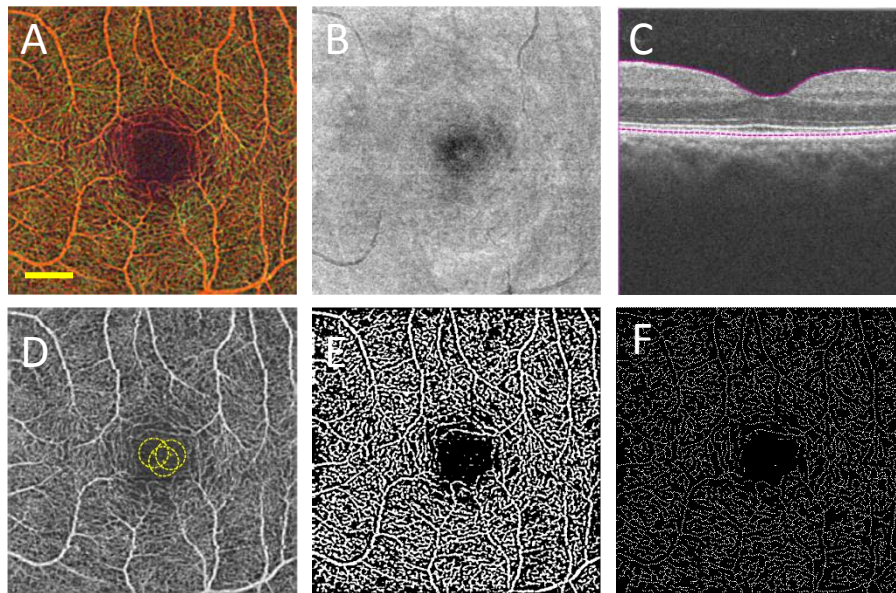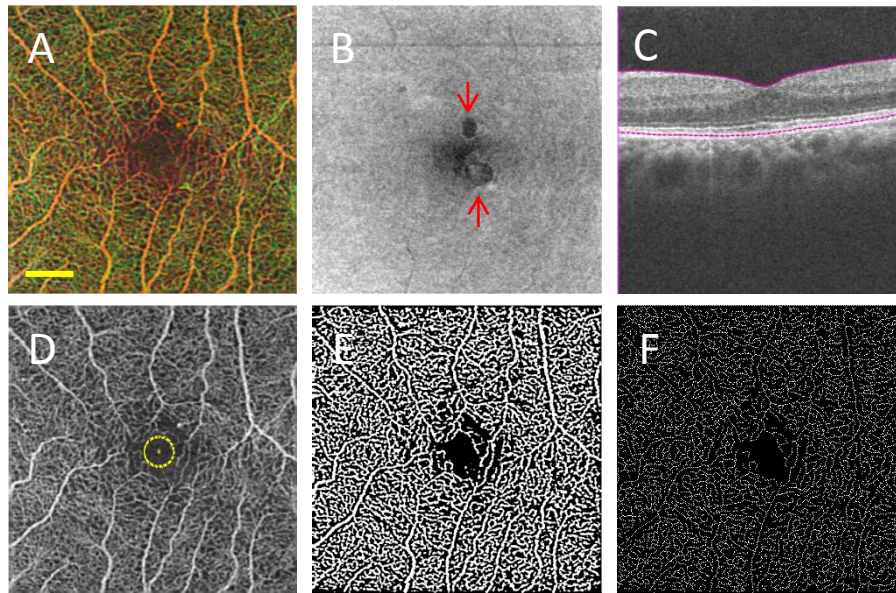**SUPPLEMENTARY FIGURES**

SUPPLEMENTARY FIGURE S1. OCTA post-processed images of a 3x3 mm area centered on the fovea of a healthy subject. En face representation of retinal blood flow can be viewed as a (A) color-coded map of vasculature, with red representing the superior retinal vascular layer, green representing the deep vascular layer, and blue representing the outer avascular retinal layer. (B) Non-segmented retinal vascular layer, consisting of vasculature between the red borders in (C), which extends from the inner limiting membrane to the retinal pigment epithelium. The segmentation scheme defining the superficial, deep, and outer retinal layers is also included and labeled in (C). The SRL OCTA image (D), DRL image (E), and ORL image (F) are shown. The *yellow scale bar* in (A) shows a distance of 500 μm. This scale applies to (A,B,D-F).
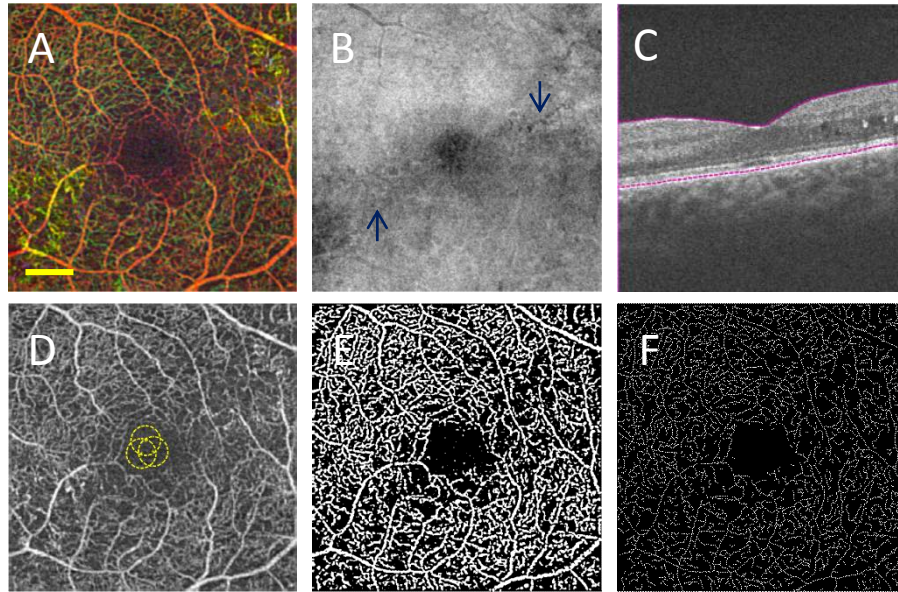
SUPPLEMENTARY FIGURE S2. OCTA with density and fractal pattern analysis of a 3x3 mm area centered on the fovea of a healthy subject. En face representation of retinal perfusion can be viewed as a (A) depth-encoded color map, with red representing the superior retinal vascular layer, green representing the deep vascular layer, and blue representing the outer avascular retinal layer. (B) Raw intensity en face OCTA image showing no significant artifact. (C) OCT cross-sectional B-scan of through the fovea with outlined segmentation from the inner limiting membrane to the retinal pigment epithelium representing the non-segmented OCTA layer. (D) OCTA image of the non-segmented retinal vasculature with selection of noise thresholding marked in the foveal avascular zone. Contrast-enhanced (E) binarized and (F) skeletonized images of retinal blood flow around the macula. The *yellow scale bar* in (A) shows a distance of 500 μm. This scale applies to (A,B,D-F).

SUPPLEMENTARY FIGURE S3. OCTA with density and fractal pattern analysis of a 3x3 mm area centered on the fovea of a subject with mild non-proliferative diabetic retinopathy (NPDR) without macular edema. En face representation of retinal perfusion can be viewed as a (A) depth-encoded color map of vasculature, with red representing the superior retinal vascular layer, green representing the deep vascular layer, and blue representing the outer avascular retinal layer. (B) Intensity en face OCTA image showing no significant artifact. (C) OCT cross-sectional B-scan of through the fovea with outlined segmentation from the inner limiting membrane to the retinal pigment epithelium. (D) OCTA image of the non-segmented retinal vasculature with selection of noise thresholding marked in the foveal avascular zone. Contrast-enhanced (E) binarized and (F) skeletonized images of retinal blood flow around the macula. The *yellow scale bar* in (A) shows a distance of 500 μm. This scale applies to (A,B,D-F).
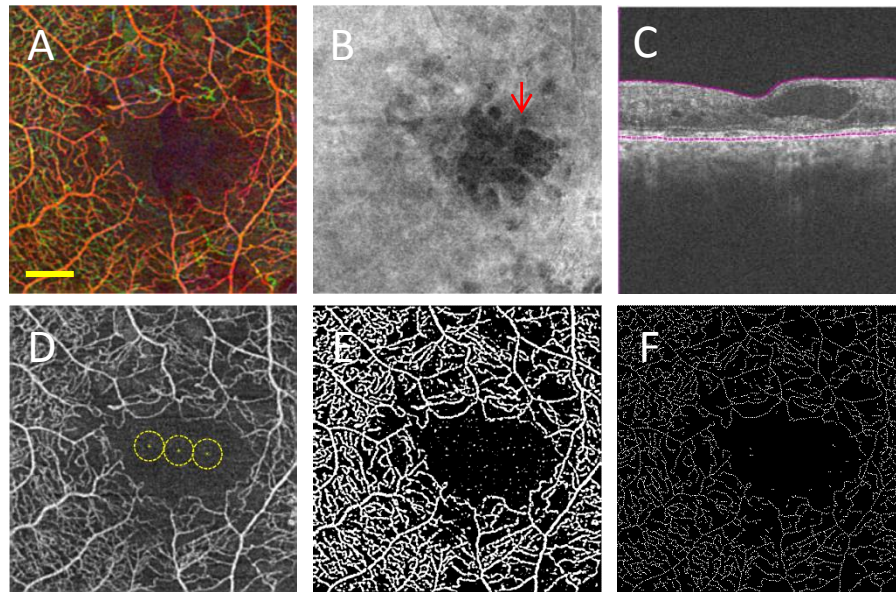
SUPPLEMENTARY FIGURE S4. OCTA with density and fractal pattern analysis of a 3x3 mm area centered on the fovea of a subject with mild non-proliferative diabetic retinopathy (NPDR) with cystoid macular edema (CME). En face representation of retinal blood flow can be viewed as a (A) depth encoded color map of vasculature, with red representing the superior retinal vascular layer, green representing the deep vascular layer, and blue representing the outer avascular retinal layer. (B) Raw intensity en face OCTA image showing no significant artifact. Areas of circumscribed hyporeflectivity (*red arrows*) indicate presence of intraretinal fluid (see Supplementary Fig. S8). (C) OCT cross-sectional B-scan of through the fovea showing CME, with outlined segmentation from the inner limiting membrane to the retinal pigment epithelium. (D) OCTA image of the non-segmented retinal vasculature with selection of noise thresholding marked in the foveal avascular zone. Contrast-enhanced (E) binarized and (F) skeletonized images of retinal blood flow around the macula. The *yellow scale bar* in (A) shows a distance of 500 µm. This scale applies to (A,B,D-F).

SUPPLEMENTARY FIGURE S5. OCTA with density and fractal pattern analysis of a 3x3 mm area centered on the fovea of a subject with severe non-proliferative diabetic retinopathy (NPDR) with parafoveal edema and hard exudate. En face representation of retinal perfusion can be viewed as a (A) depth encoded color map of vasculature, with red representing the superior retinal vascular layer, green representing the deep vascular layer, and blue representing the outer avascular retinal layer. (B) Intensity en face OCTA image showing no overlying artifact. Areas of patchy hypo- and hyperreflectivity (*blue arrows*) indicate presence of intraretinal fluid and hard exudate (See Figure 5b). (C) OCT cross-sectional B-scan of through the fovea with outlined segmentation from the inner limiting membrane to the retinal pigment epithelium. (D) OCTA image of the non-segmented retinal vasculature with selection of noise thresholding marked in the foveal avascular zone. Contrast-enhanced (E) binarized and (F) skeletonized images of retinal blood flow around the macula. The *yellow scale bar* in (A) shows a distance of 500 µm. This scale applies to (A,B,D-F).

SUPPLEMENTARY FIGURE S6. OCTA with density and fractal pattern analysis of a 3x3 mm area centered on the fovea of a subject with proliferative diabetic retinopathy (PDR) and cystoid macular edema. En face representation of retinal blood flow can be viewed as a (A) color-coded map of vasculature, with red representing the superior retinal vascular layer, green representing the deep vascular layer, and blue representing the outer avascular retinal layer. (B) Intensity en face OCTA image showing no overlying artifact. Clusters of circular hyporeflectivity (*red arrow*) indicate presence of significant intraretinal fluid (see Supplementary Fig. S9). (C) OCT cross-sectional B-scan of through the fovea with outlined segmentation from the inner limiting membrane to the retinal pigment epithelium, also depicting a large area of cystoid intraretinal fluid crossing the fovea. (D) OCTA image of the non-segmented retinal vasculature with selection of noise thresholding marked in the foveal avascular zone. Contrast-enhanced (E) binarized and (F) skeletonized images of retinal blood flow around the macula. The *yellow scale bar* in (A) shows a distance of 500 μm. This scale applies to (A,B,D-F).